REMARKS

Claims 2 to 5 and 7 to 10 are pending in the application. Claims 2, 3, 5, 7, 8 and 10 are the independent claims. Reconsideration and further examination are respectfully requested.

Initially, Applicant thanks the Examiner for his approval of Applicant's proposed drawing changes. In accordance with the Examiner's requirement, corrected formal drawings incorporating the approved changes are enclosed herewith.

Turning to the art rejections, Claims 2 to 4 and 7 to 9 were rejected under 35 U.S.C. § 103(a) over U.S. Patent No. 4,484,349 (McCubbrey) in view of U.S. Patent No. 4,665,440 (Tromborg), and further in view of U.S. Patent No. 6,212,303 (Doran); and Claims 5 and 10 were rejected under § 103(a) over McCubbrey in view of Tromborg. Reconsideration and withdrawal of these rejections are respectfully requested.

With respect to specific claim language, independent Claim 2 is directed to an imaging sensor which includes a sensor array segmented into plural disjoint segments, a respective plurality of output pipelines, one of the output pipelines corresponding to each of the plural segments of the sensor array, and means for duplicating image data for an overlap region at each boundary between segments, wherein the means for duplicating image data comprises charge or voltage duplicating circuitry that obtains multiple outputs for each pixel in the overlap region, and wherein the duplication circuitry provides each of the multiple outputs to individual ones of the output pipelines that border on the overlap region.

The applied art, namely McCubbrey, Tromborg and Doran, is not seen to disclose or suggest the foregoing features of independent Claim 2, particularly with respect

to means for duplicating image data for an overlap region at each boundary between segments, wherein the means for duplicating image data comprises charge or voltage duplicating circuitry that obtains multiple outputs for each pixel in the overlap region, and wherein the duplication circuitry provides each of the multiple outputs to individual ones of the output pipelines that border on the overlap region.

In this regard, McCubbrey is seen to be directed to a parallel image pipeline image processor in which adjacent segments of a partitioned image matrix from a television camera are operated on by a plurality of serial neighborhood transformation pipelines. (McCubbrey, abstract; Fig.1; column 2, lines 29 to 68; and column 3, lines 1 to 9). McCubbrey is also seen to disclose the bidirectional transfer of pixel data on the edges of adjoining segments of the image matrix between adjacent processors in a manner which minimizes connections between the processors. (McCubbrey, column 4, lines 46 to 66).

As stated in Applicant's previous Amendment, although McCubbrey is seen to transfer neighborhood edge pixels between adjacent stages in the pipeline, nowhere is McCubbrey seen to disclose or suggest the use of *charge or voltage duplicating circuitry that obtains multiple outputs for each pixel in the overlap region*, and wherein the duplication circuitry provides each of the multiple outputs to individual ones of the output pipelines that border on the overlap region.

Transfer control circuitry 56 of McCubbrey is seen merely to transfer edge pixels via connections 60 and 62, but, as admitted in the Office Action, McCubbrey is not seen to obtain multiple outputs for each pixel in the overlap region and provide each of the multiple outputs to individual ones of the output pipelines that border on the overlap region. In addition, also as admitted in the office action, McCubbrey is not seen to be

directed to a sensor array segmented into plural disjoint segments having a respective plurality of output pipelines.

Tromborg is not seen to remedy the foregoing deficiencies of McCubbrey with respect to independent Claim 2. In particular, Tromborg is seen to be directed to a monolithic (one-chip) image sensor array which has segmented shift-register output circuitry with parallel outputs, each output being supplied to a separate processor. (Tromborg, abstract; Fig. 5; column 1, lines 65 to 68; column 2, lines 1 to 41; and column 3, lines 54 to 63). However, as admitted in the Office Action, nowhere is Tromborg even seen to be concerned with the problem of duplicating neighboring pixels between parallel outputs for the overlap region. In addition, there is not seen to be any motivation or suggestion in either McCubbrey or Tromborg for addressing the duplication of neighboring pixels between parallel outputs from a segmented image sensor array for the overlap region. Even if a combination were made of McCubbrey and Tromborg, for which no motivation or suggestion is seen, such a combination would not disclose or suggest the use of *charge or voltage duplicating circuitry that obtains multiple outputs for each pixel in the overlap region*, and that provides each of the multiple outputs to individual ones of the output pipelines that border on the overlap region.

In this regard, it is again alleged in the Office Action that Doran discloses the aforementioned duplication circuitry. Again, Applicant strongly disagrees with this characterization of Doran. In particular, Doran is seen to be directed to high speed processing of image data scanned from a document. (Doran, abstract; Fig. 1; and column 2, lines 25 to 52). In Doran, scan line pixel data from a scanner is received by a splitter and divided into four channels (30-1 to 30-4) and overlap data (T, B) is added to the beginning

and end of each channel of pixel data. (Doran, Fig. 3; column 8, lines 52 to 67; and column 9, lines 1 to 35). However, Doran is not seen to disclose the use of the use of *charge or voltage duplicating circuitry that obtains multiple outputs for each pixel in the overlap region*, and that provides each of the multiple outputs *to individual ones of the output pipelines that border on the overlap region*. Instead, Doran is simply seen to add predetermined number of pixels to each divided segment of data before the data segment is sent to a corresponding channel for parallel processing. (Doran, Fig. 3; column 8, lines 52 to 67; and column 9, lines 1 to 19).

The Response To Arguments section of the Office Action alleges that "Applicant is using an overly narrow interpretation of the claim language." Applicant strongly disagrees with this characterization of Applicant's previous remarks, which simply pointed out that claim elements of the present invention are nowhere seen to be disclosed in the applied references. In particular, the Examiner appears to take the position that a memory storage (32-B) of Doran in *inherently* the same as the *charge or voltage duplicating circuitry that obtains multiple outputs for each pixel in the overlap region*, as in the present invention. The Examiner's position improperly removes claim limitations from the claimed invention because memory 32-B of Doran is nowhere seen to perform in any way the function of obtaining *multiple outputs for each pixel in the overlap region.* See M.P.E.P. § 2143.03.

"To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a

reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations." M.P.E.P. § 2143.

Based on the foregoing, Applicant respectfully submits that McCubbrey, Tromborg and Doran, either alone or in combination, are not seen to render obvious the invention of independent Claim 2 because those references are not seen to teach the combination of features in independent Claim 2. Independent Claim 2 is therefore believed to be in condition for allowance, and such action is respectfully requested. In addition, independent Claim 7 is directed to a method claim which includes substantially similar features as that of independent Claim 2, and is therefore also believed to be in condition for allowance for the same reasons discussed above with respect to independent Claim 2.

Independent Claim 3 is directed to an imaging sensor which includes a sensor array segmented into plural disjoint segments, a respective plurality of output pipelines, one of the output pipelines corresponding to each of the plural segments of the sensor array, means for duplicating image data for an overlap region at each boundary between segments, and a respective plurality of processors, each processor coupled to a respective one of the output pipelines, wherein the means for duplicating includes an output pipeline for outputting pixel values of pixels in the overlap region to an intermediate buffer, the intermediate buffer providing duplicate pixel values to each processor whose segment borders the overlap region.

The applied art, namely McCubbrey, Tromborg and Doran, is not seen to disclose or suggest the foregoing features of independent Claim 3, particularly with respect to means for duplicating image data for an overlap region at each boundary between segments, and a respective plurality of processors, each processor coupled to a respective

one of the output pipelines, *wherein the means for duplicating includes an output pipeline for outputting pixel values of pixels in the overlap region to an intermediate buffer, the intermediate buffer providing duplicate pixel values to each processor whose segment borders the overlap region.*

As discussed above with respect to independent Claim 2, neither McCubbrey nor Tromborg is seen to disclose or suggest means for duplicating image data for an overlap region at each boundary between segments, much less wherein each of a plurality of processors is coupled to a respective output pipeline, and *wherein the means for duplicating includes an output pipeline for outputting pixel values of pixels in the overlap region to an intermediate buffer, the intermediate buffer providing duplicate pixel values to each processor whose segment borders the overlap region.*

In this regard, Doran is not seen to remedy the foregoing deficiencies of McCubbrey and Tromborg with respect to independent Claim 3. As discussed above with respect to independent Claim 2, Doran is at most seen to disclose that scan line pixel data from a scanner is divided into four channels and overlap data (T, B) is added to the beginning and end of each channels pixel data. (Doran, Fig. 3; column 8, lines 52 to 67; and column 9, lines 1 to 35). However, nowhere is Doran seen to disclose or suggest the use of means for duplicating image data for an overlap region at each boundary between segments, wherein each of a plurality of processors is coupled to a respective output pipeline and *wherein the means for duplicating includes an output pipeline for outputting pixel values of pixels in the overlap region to an intermediate buffer, the intermediate buffer providing duplicate pixel values to each processor whose segment borders the overlap region.*

In particular, Doran is simply seen to add predetermined number of pixels to each divided segment of data before the data segment is sent to a corresponding channel for parallel processing, but Doran is not seen to use of a plurality of intermediate buffers for holding pixels of overlap regions, and then sending the contents of each intermediate buffers to a corresponding one of a plurality of processors. (Doran, Fig. 3; column 8, lines 52 to 67; and column 9, lines 1 to 19).

Based on the foregoing, Applicant respectfully submits that McCubbrey, Tromborg and Doran, either alone or in combination, are not seen to render obvious the invention of independent Claim 3 because those references are not seen to teach the combination of features in independent Claim 3. Independent Claim 3 is therefore believed to be in condition for allowance, and such action is respectfully requested. In addition, independent Claim 8 is directed to a method claim which includes substantially similar features as that of independent Claim 3, and is therefore also believed to be in condition for allowance for the same reasons discussed above with respect to independent Claim 3.

Independent Claim 5 is directed to an imaging sensor which includes a sensor array segmented into plural disjoint segments, a respective plurality of output pipelines, one of the output pipelines corresponding to each of the plural segments of the sensor array, means for duplicating image data for an overlap region at each boundary between segments, and a respective plurality of processors, each processor coupled to a respective one of the output pipelines, wherein the means for duplicating comprises a communication link between processors that border the overlap region, and wherein duplicate pixels are communicated between processors over the communication link.

The applied art, namely McCubbrey, Tromborg and Doran, is not seen to disclose or suggest the foregoing features of independent Claim 5, particularly with respect to *means for duplicating image data for an overlap region at each boundary between segments, wherein the means for duplicating comprises a communication link between processors that border the overlap region, and wherein duplicate pixels are communicated between processors over the communication link.*

As discussed above with respect to independent Claims 2 and 3, neither McCubbrey nor Tromborg is seen to disclose or suggest means for duplicating image data for an overlap region at each boundary between segments, much less wherein the means for duplicating comprises a communication link between processors that border the overlap region, and wherein duplicate pixels are communicated between processors over the communication link.

In this regard, Doran is not seen to remedy the foregoing deficiencies of McCubbrey and Tromborg with respect to independent Claim 5. As discussed above with respect to independent Claim 2, Doran is at most seen to disclose that scan line pixel data from a scanner is divided into four channels and overlap data (T, B) is added to the beginning and end of each channels pixel data. (Doran, Fig. 3; column 8, lines 52 to 67; and column 9, lines 1 to 35). However, nowhere is Doran seen to disclose or suggest the use of means for duplicating image data for an overlap region at each boundary between segments, *wherein the means for duplicating comprises a communication link between processors that border the overlap region, and wherein duplicate pixels are communicated between processors over the communication link.*

In particular, Doran is simply seen to add predetermined number of pixels to each divided segment of data before the data segment is sent to a corresponding channel for parallel processing, but Doran is not seen to use a communication link of any kind between parallel processors that border the overlap region, wherein duplicate pixels are communicated between processors over the communication link. (Doran, Fig. 3; column 8, lines 52 to 67; and column 9, lines 1 to 19).

Based on the foregoing, Applicant respectfully submits that McCubbrey, Tromborg and Doran, either alone or in combination, are not seen to render obvious the invention of independent Claim 5 because those references are not seen to teach the combination of features in independent Claim 5. Independent Claim 5 is therefore believed to be in condition for allowance, and such action is respectfully requested. In addition, independent Claim 10 is directed to a method claim which includes substantially similar features as that of independent Claim 5, and is therefore also believed to be in condition for allowance for the same reasons discussed above with respect to independent Claim 5.

The other pending claims remaining under consideration in this application are each dependent from the independent claims discussed above and are therefore believed patentable for the same reasons. Because each dependent claim is also deemed to define an additional aspect of the invention, however, the individual consideration of each on its own merits is respectfully requested.

Based on the foregoing amendments and remarks, the entire application is believed to be in condition for allowance, and such action is respectfully requested at the Examiner's earliest convenience.

Applicant's undersigned attorney may be reached in our Costa Mesa, CA office at (714) 540-8700. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,

Attorney for Applicant

Registration No. 40,595

FITZPATRICK, CELLA, HARPER & SCINTO
30 Rockefeller Plaza
New York, New York 10112-2200
Facsimile: (212) 218-2200

CA_MAIN 72349 v 1